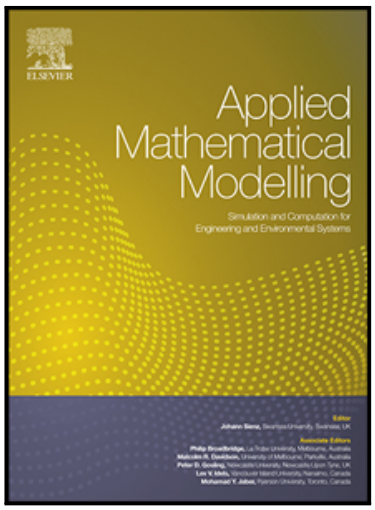

A coupled multiphysics FEM model to investigate electromagnetic, thermal and mechanical effects in complex assemblies: the design of the High Luminosity Large Hadron Collider beam screen

M. Morrone, C. Garion, M. Aurisicchio, P. Chiggiato

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Highlights

- A multiphysics model is proposed to assess the mechanical response of a complex assembly to a magnetic field variation.
- The one-way and two-way couplings between the magnetic, thermal and mechanical physics are fully investigated.
- The two-way coupling between the magnetic and thermal module turns out to lower the induced forces up to approximately 40%.
- Dynamic effects such as self-inductance phenomena lower and delay in time the induced forces for highly conductive materials.